

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A surgical instrument navigation system, comprising:

a surgical instrument;

an imaging device operable to capture image data representative of a patient in a first orientation;

a tracking subsystem operable to capture in real-time position data indicative of the position of the surgical instrument;

a data processor adapted to receive image data from the imaging device and position data from the tracking subsystem, the data processor being operable to generate a three-dimensional representation of the surgical instrument as it would visually appear from either of at least two different perspectives and to overlay the representation of the surgical instrument onto the image data of the patient in the first orientation; and

a display in data communication with the data processor, the display being operable to display the representation of the surgical instrument in at least one of the two different perspectives superimposed onto the image data of the patient in the first orientation.

2. (Original) The surgical instrument navigation system of Claim 1 wherein the processor is further operable to track in real-time the position of the surgical instrument as it is moved by a surgeon and generate a corresponding representation of the surgical instrument in relation to the image data of the patient.

3. (Original) The surgical instrument navigation system of Claim 1 wherein the imaging device is further defined as a rotatable C-arm, such that at least one of the two different perspectives is determined by an orientation of the C-arm in relation to the patient.

4. (Original) The surgical instrument navigation system of Claim 1 wherein the imaging device further includes an image source emanating radiation towards the patient and an image receiver positioned to receive radiation from the image source, such that the generated representation of the surgical instrument visually appears as it would from either the perspective of the image source or the perspective of the image receiver.

5. (Original) The surgical instrument navigation system of Claim 1 wherein the generated representation of the surgical instrument visually appears from a perspective that is selectable by a user of the navigation system.

6. (Original) The surgical instrument navigation system of Claim 5 wherein the display further includes a touch screen activated button operable to select the perspective of the generated representation of the surgical instrument.

7. (Original) The surgical instrument navigation system of Claim 1 wherein the display visually indicates the perspective of the generated representation of the surgical instrument as it appears to a user of the navigation system.

8. (Original) The surgical instrument navigation system of Claim 1 wherein the imaging device is selected from the group consisting of x-ray imaging device, computed tomography imaging device and magnetic resonance imaging device.

9. (Original) The surgical instrument navigation system of Claim 1 wherein the tracking subsystem employs a non-contact positional location technique that is based on at least one of radio waves, infrared waves, magnetic fields, or sonic emissions.

10. (Currently Amended) A surgical instrument navigation system, comprising:
a surgical instrument;
an imaging device operable to capture image data representative of a patient in an orientation, the imaging device including an image source emanating radiation towards the patient and an image receiver positioned to receive radiation from the image source;

a tracking subsystem operable to capture in real-time position data indicative of the position of the surgical instrument;

a data processor adapted to receive image data from the imaging device and position data from the tracking subsystem, the data processor being operable to generate a three-dimensional representation of the surgical instrument as it would visually appear from either the perspective of the image source or the perspective of the image receiver and to overlay the representation of the surgical instrument onto the image data of the patient in the orientation; and

a display in data communication with the data processor, the display being operable to display the representation of the surgical instrument superimposed onto the image data of the patient.

11. (Original) The surgical instrument navigation system of Claim 10 wherein the processor is further operable to track in real-time the position of the surgical instrument as it is moved by a surgeon and generate a corresponding representation of the surgical instrument in relation to the image data of the patient

12. (Original) The surgical instrument navigation system of Claim 10 wherein the generated representation of the surgical instrument visually appears from a perspective that is selectable by a user of the navigation system.

13. (Original) The surgical instrument navigation system of Claim 12 wherein the display is further defined as a graphical user interface having a touch screen activated button to select the perspective of the generated representation of the surgical instrument.

14. (Original) The surgical instrument navigation system of Claim 10 wherein the imaging device is selected from the group consisting of x-ray imaging device, computed tomography imaging device and magnetic resonance imaging device.

15. (Original) The surgical instrument navigation system of Claim 10 wherein the tracking subsystem employs a non-contact positional location technique that is based on at least one of radio waves, infrared waves, magnetic fields, or sonic emissions.

16. (Original) A method for displaying a virtual representation of a surgical instrument using a surgical instrument navigation system, comprising:

capturing image data representative of a patient using an imaging device;

rendering a three-dimensional representation of the surgical instrument as it would visually appear from a first perspective;

displaying the representation of the surgical instrument superimposed onto the image data of the patient; and

subsequently displaying the representation of the surgical instrument as it would visually appear from a second perspective that is selectable by an operator of the surgical instrument navigation system.

17. (Original) The method of Claim 16 further comprises capturing in real-time position data indicative of the position of the surgical instrument and displaying the representation of the surgical instrument superimposed onto the image data of the patient in accordance with the position data for the surgical instrument.

18. (Original) The method of Claim 16 wherein the step of subsequently displaying the representation of the surgical instrument further comprises selecting a perspective from which to view the representation of the surgical instrument; rendering a representation of the surgical instrument in accordance with the selected perspective; and displaying the representation of the surgical instrument superimposed onto the image data of the patient.

19. (New) A method for displaying a virtual representation of a surgical instrument using a surgical instrument navigation system, comprising:

capturing image data representative of an orientation of at least a portion of a patient using an imaging device;

rendering a three-dimensional representation of the surgical instrument as it would visually appear from at least two perspectives relative to the portion of the patient in the orientation; and

displaying the representation of the surgical instrument in one of the at least two perspectives superimposed onto the image data of the patient in the orientation.

20. (New) The method of claim 19, further comprising:

subsequent to displaying the representation of the surgical instrument in one of the at least two perspectives displaying the representation of the surgical instrument as it would visually appear from a second perspective that is selectable by an operator of the surgical instrument navigation system.

21. (New) The surgical instrument navigation system of claim 1, wherein the image data representative of a patient in a first orientation is selected from a group comprising a lateral view, a medial view, and an axial view.

22. (New) The surgical instrument navigation system of claim 1, wherein the display of the representation of the surgical instrument in at least one of the two different perspectives may be superimposed onto the image data of the patient in a single position to represent a perspective of the surgical instrument in the same image data.

23. (New) The surgical instrument navigation system of claim 1, wherein the representation of the surgical instrument in at least one of the two different

perspectives includes a first perspective is about 180 degrees about a single axis relative to the second perspective.

24. (New) The surgical instrument navigation system of claim 1, wherein the representation of the surgical instrument includes a three dimensional icon of the surgical instrument that may visually appear from either of at least two different perspectives.